

Optical Fluorescence O<sub>2</sub> Analyzer  
for Measuring Headspace, Dissolved Oxygen,  
Oxygen Permeation and Package Leak



## OpTech<sup>®</sup>-O<sub>2</sub> Model P

Conforms to ASTM Standards  
F2714-08 and F3136-15

Versatile | Innovative | Easy-to-use



  
**mocon**<sup>®</sup>

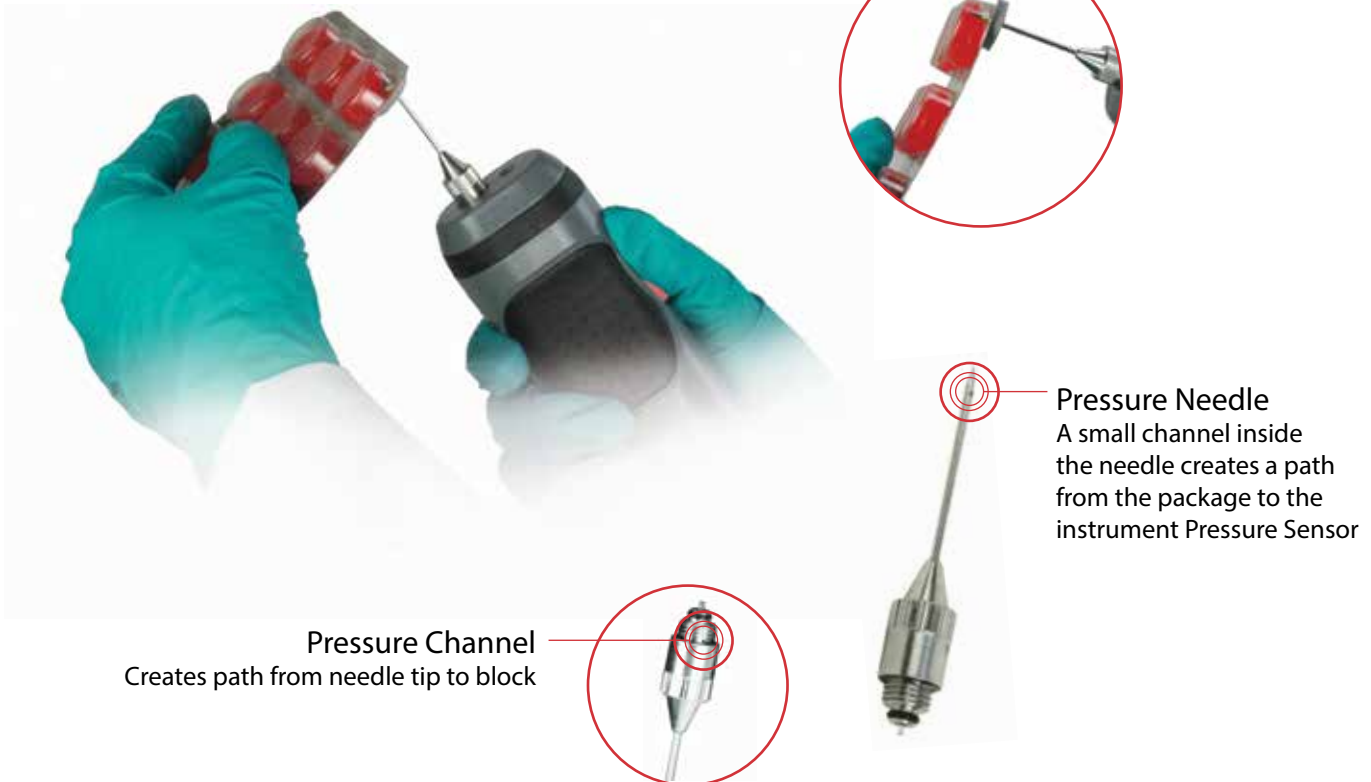
# Improved OpTech-O<sub>2</sub> Model P

- Ergonomic
- No bulky fiber optic cables
- Lightweight and portable (with Portability Kit)
- Reusable, easy to place sensors – no glues needed
- Easy calibration methods for all sensors
- No gas calibration needed
- Automatic barometric pressure compensation
- Robust invasive needle, no headspace extraction – designed to analyze limited headspace and eliminate inaccuracy caused by unknown internal package pressure.
- Visible, non-UV light source for simple, targeted reading
- Accurate readings through colored packaging material and post production shelf life studies
- ImPULSE™ sensor for opaque packaging materials
- Packaging oriented software package

## **NEW** Pressure Needle\*

When the needle enters the package, the pressure inside the package is automatically compensated, ensuring an accurate oxygen reading.

The internal pressure of your package directly impacts on the accuracy of the oxygen reading



# The ideal multi-purpose analyzer – versatile, innovative and easy-to-use

## OpTech®-O<sub>2</sub> Model P: measure headspace, dissolved oxygen, package leaks, oxygen permeation and conduct shelf life studies using optical fluorescence technology.

The ideal multi-purpose analyzer for food, beverage, pharmaceutical and medical applications where measuring oxygen and understanding its effect on product shelf life is critical. The internal pressure of a package directly impacts the accuracy of any oxygen readings. Use the new Pressure Needle with the OpTech-O<sub>2</sub> Model P to eliminate errors from manual pressure inputs or when the internal package pressure is not known.

### Headspace - Leak Detection - Package Permeation

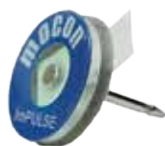
#### Sensor types:



The adhesive sensor requires no preparation and is designed to be inserted into the package, where it is immediately available for use. Testing is conducted through the package wall. The adhesive sensor is available in permanent or reusable versions and can also be used to measure dissolved oxygen.



Reads accurately through colored packaging materials



The ImPULSE™ sensor is designed to be inserted into retort and opaque packages, enabling the OpTech-O<sub>2</sub> to monitor the headspace or dissolved oxygen. As the sensor is non-consuming, it is ideal for long term post production shelf life studies.



The OpTech-O<sub>2</sub> Pressure Needle is designed to measure headspace oxygen in any package including limited volume packages. To measure, simply place the tip of the needle into the headspace, and press the activation button. No oxygen is extracted. When the Pressure Needle enters the package, the pressure inside the package is automatically compensated, ensuring an accurate oxygen reading. The non-compensating Safety and Sharp needles are still available.

## OpTech-O<sub>2</sub> Model P Applications

- Non-destructive shelf life analysis
- Film permeation (including perforated films)
- Package permeation
- Headspace (invasive or non-destructive)
- Dissolved oxygen
- Total Package Oxygen (TPO)
- Gross Leak



Headspace & Permeation



Limited Headspace



Leak Detection



MAP & Quality Control



Produce Films



Dissolved Oxygen and Total Package Oxygen



Retort & Opaque Packages



Transportation Studies



Pharmaceuticals



Medical Device



Test Multiple Samples

# Useful for food, beverage, pharmaceutical and medical applications

## Software Features

- Unlimited number of concurrent tests
- Continuously monitor O<sub>2</sub> in real time
- One graph - percentage O<sub>2</sub> and transmission rate versus time
- Headspace values with pass/fail limits
- Advanced calibration for wines and spirits, provides increased accuracy at different alcohol % levels
- Barcode system automatically retrieves previous sample data
- Built-in temperature and barometric pressure compensation
- Automatic package pressure compensation when using the Pressure Needle

Option:

CFR 21 Part 11 compliant

## The versatile OpTech-O<sub>2</sub> Model P provides accurate results, simply and effectively

- Testing does not consume oxygen - ideal for long term oxygen studies
- Oxygen permeation rates of multiple packages or films
- Determine product shelf life for an oxygen sensitive product
- Perform quality control of MAP packages right off the production line (including packages with very limited headspace)
- Conduct transportation and distribution studies
- Understand the effects of total package oxygen including package headspace, as well as dissolved oxygen in a liquid product
- Automatic barometric pressure compensation ensuring accurate, trusted results
- Detect packages with gross leaks



# Measure oxygen and understand its effect on products and their shelf life

## Calibration Solved Beautifully

Trust MOCON to come up with a breakthrough method of simple calibration for the OpTech-O<sub>2</sub>. Just select "Calibrate" in the software menu or read the barcode on the CalCard, take a reading of "0%", then "Air", it's as simple as that! No gases needed, and one calibration works for all sensor types. To calibrate the OpTech-O<sub>2</sub> needle, use the CalVial™.



## Why is Internal Package Pressure Important?

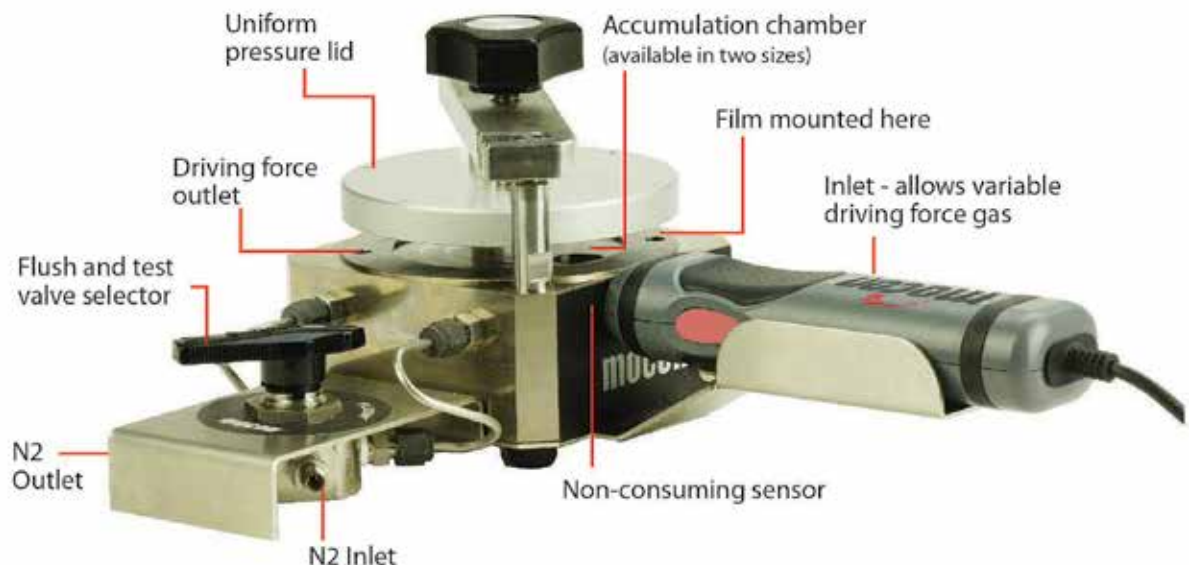
The internal package pressure directly impacts the accuracy of the oxygen reading with optical fluorescence instruments. For example, if the internal package pressure is half the ambient pressure and is not compensated by the instrument, the oxygen percentage will falsely read half the actual percentage in the package. Conversely, if the internal package pressure is twice the ambient pressure, the oxygen percentage will falsely read two times higher than the actual percentage.

Incorrect oxygen readings directly impact the projected shelf life requirements.

For this reason, all current optical technologies must compensate for the internal package pressure. The OpTech-O<sub>2</sub> Model P takes advantage of a pressure sensor inside the instrument to compensate for the internal package pressure.

## Optional Permeation Test Cell

The OpTech-O<sub>2</sub> Film Permeation Cell allows for oxygen transmission rate testing of medium and high transmission rate films, including real transmission rates of perforated films as used in fresh produce applications.



# OpTech-O<sub>2</sub> Model P Specifications

| Detector and Base     |  |
|-----------------------|--|
| Warm-up time          | 20 minutes   |
| Detector dimensions   | Width: 1.3" 3.30cm<br>Height: 1.9" 4.83 cm<br>Depth: 9" 22.86 cm (with needle), 6" 15.24 cm (without needle) |
| Base dimensions       | Width: 4.8" 12.19 cm<br>Height: 2.7" 6.8 cm<br>Depth: 10" 25.40 cm   |
| Measurement method    | Epifluorescence Confocal   |
| Power                 | Standard Power USB port (2.5 watt)   |
| Operating temperature | 10-35°C  |
| Operating humidity    | 0-100% non-condensing  |
| Compliance            | CE/CSA/UL  |
| PDF report options    | Through program from computer  |

| Sensors - Adhesive and ImPULSE™    |   |
|------------------------------------|---|
| Application                        | Adhesive: Sensor is inside package. ImPULSE: Sensor is external                                 |
| Pressure Compensation              | Automatic Barometric Compensation   |
| Repeatability Adhesive (Certified) | ± 0.015% (150 ppm) O <sub>2</sub> or 3% of Reading, whichever is greater                        |
| Repeatability ImPULSE (Certified)  | ± 0.05% (500 ppm) O <sub>2</sub> or 3% of Reading, whichever is greater                         |
| Range Adhesive                     | 0.001% (10 ppm) to 25% O <sub>2</sub> Permeation Mode<br>0.015% (150 ppm) to 25% Headspace Mode |
| Range ImPULSE                      | 0.05% O <sub>2</sub> (500ppm) to 25% O <sub>2</sub>   |
| Dissolved Oxygen Range             | 0.006mg/L to 10.5mg/L   |
| Warm up time                       | None  |
| Adhesion                           | Sensors come ready to apply   |
| Operating temperature              | 5 – 40 °C   |
| Operating humidity                 | 0-100% Sensors are designed to be immersed  |

| Sharp & Safety Needle Sensors |  |
|-------------------------------|--|
| Application                   | Sensor in needle must be 100% in volume                                  |
| Pressure Compensation         | Automatic Barometric Compensation  |
| Resolution                    | 0.001% (10 ppm)  |
| Repeatability                 | ± 0.015% (150 ppm) O <sub>2</sub> or 2% of Reading, whichever is greater |
| Range                         | 0.050% (500 ppm) to 25% O <sub>2</sub>                                   |
| Warm up time                  | None   |
| Operating temperature         | 5 – 40 °C  |
| Operating humidity            | 0-100% non-condensing. Needle must not get wet                           |

| Pressure Compensation Needle Sensors |   |
|--------------------------------------|---|
| Application                          | Sensor in needle must be 100% in volume                                   |
| Resolution                           | 0.001% (10 ppm)   |
| Repeatability                        |   |
| Package Pressure Range               |   |
| 0 to 150 mmHg                        | ± 0.100% (1000 ppm) O <sub>2</sub> or 5% of Reading, whichever is greater |
| 150 to 1,000 mmHg                    | ± 0.015% (150 ppm) O <sub>2</sub> or 2% of Reading, whichever is greater  |
| Range                                | 0.050% (500 ppm) to 25%   |
| Warm up time                         | None  |
| Operating temperature                | 5 – 40 °C   |
| Operating humidity                   | 0-100% non-condensing. Needle must not get wet                            |

| Computer Tablet and Case - subject to change |  |
|--|--|
| Dimensions (w x d x h)                       | 5.9 x 9.21 x 0.61 in (15 x 23.4 x 1.5cm) |
| Weight                                       | Starting at 1.5 lb (0.69 kg)             |
| Operating system                             | Windows® Professional 32                 |
| Ports  | 1 USB 2.0                                |
| Carrying Bag                                 | 9 x 2.5 x 12 in (22.86 x 6.35 x 30.48cm) |

| CalCard® |  |
|----------|--|
| Accuracy | ± 2% or +/-150 ppm, whichever is greater |

| CalVial™ |          |
|----------|----------|
| Accuracy | ±150 ppm |

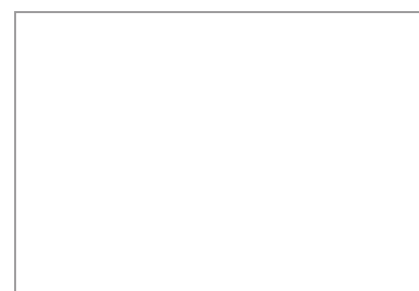
## What is Fluorescence Technology?

Fluorescent chemistries, such as the platinum chemistry used in the OpTech-O<sub>2</sub>, give off light when stimulated or excited by an external light source. The rate of decay of the fluorescence is directly proportional to the concentration of oxygen present. This is read by the OpTech-O<sub>2</sub> instrument and reported as a percentage of oxygen present in the package. Fluorescence technology does not consume oxygen, making it ideal for long term oxygen studies.

## Why Platinum Chemistry?

- Increased measuring range
- Increased sensitivity
- Stable in ambient light
- Less affected by temperature changes
- Greater usable lifetime

Your Local MOCON Representative:



Conforms to ASTM F2714-08 and F3136-15

## MOCON® Commitment

These analytical instruments are another example of MOCON's long-standing commitment to innovation and quality in the support of our customers.

## Technical Support & Service

MOCON offers a variety of technical services designed to provide you with first class support. Whether you require technical support, next-day spare parts delivery, on-site training, N.I.S.T. certification or "turn-key" validation, our staff can tailor a service program to fit your needs. Our goal is to provide the best in product support services.

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